REMARKS

In response to the Office Action of August 26, 2011, Applicants have amended the claims, which when considered with the following remarks, is deemed to place the present application in condition for allowance. Favorable consideration and allowance of all pending claims is respectfully requested. The amendments to the claims have been made in the interest of expediting prosecution of this case. Applicants reserve the right to prosecute the same or similar subject matter in this or another application.

Claims 64-84 are pending in this application. Initially, Claims 72-85 have been renumbered as Claims 71-84, pursuant to the Examiner's suggestion. It is also noted that the Examiner has renumbered the claims when making the rejections in the Office Action, which are set forth below. By this Amendment, Claims 64, 69-73 and 76 have been amended and Claim 68 has been cancelled. Claim 64 has been amended to incorporate the limitation of Claim 68, and Claims 69-73and 76 have been amended to correct claim dependency. Applicant respectfully submits that no new matter has been added to this application. Moreover, it is believed that the claims as presented herein place the application in condition for allowance.

The Examiner rejected Claims 64-66, 71, 79, 83 and 84 under 35 U.S.C. §103(a) as being obvious over Heneghan et al., JOURNAL OF ENGINEERING FOR GAS TURBINES AND POWER TRANSACTIONS OF THE ASME ("Heneghan et al.") in view of Bartz et al. U.S. Patent No. 5,814,110 ("Bartz et al.") and Chadwick U.S. Patent Publication No. 2004/0230397 ("Chadwick"). Although not necessarily agreeing with the Examiner, independent Claim 64 has been amended to incorporate the limitation of unrejected Claim 68. Accordingly, this rejection is

deemed moot. Thus, Applicant respectfully requests that this rejection be withdrawn.

The Examiner has rejected Claims 67-69 and 72-74 under 35 U.S.C. §103(a) as being unpatentable over Heneghan et al., and Bartz et al. and Chadwick as applied to Claims 64-66, 71, 79, 83 and 84 above, and further in view of Cherpeck U.S. Patent No. 5,399,178 ("Cherpeck '178"). Of these claims, Claim 68 has been incorporated into independent Claim 64.

Nowhere do the combination of Heneghan et al., Bartz et al., Chadwick and Cherpeck '178 disclose or suggest a "high throughput method for screening fuel additive composition samples, under program control, comprising: (a) conducting molecular modeling of at least one fuel additive to formulate a leading candidate fuel additive composition sample for testing; (b) containing a plurality of the leading candidate fuel additive composition samples in a plurality of test receptacles, each sample comprising at least one fuel additive, wherein the plurality of leading candidate fuel additive composition samples is at least 20; (c) measuring the deposit formation of each sample to provide deposit formation data results for each sample, wherein the step of measuring the deposit formation of each sample comprises heating the sample to a first predetermined temperature and determining the weight loss of the sample after a first predetermined period of time; and, (d) outputting the results of step (c), wherein the results of step (c) for each sample are transmitted to a computer, wherein the computer compares the results with a predetermined value delimiting a failure or passing of the results, and the computer identifies failed samples to preclude further testing of the failed samples," as presently recited in amended Claim 64, from which Claims 67, 69 and 72-74 ultimately depend.

Rather, Heneghan et al. disclose the study of jet fuel thermal stability (carbon deposition rate), dissolved oxygen consumption and methane production for three baseline jet fuels and three fuels blended with additives using a flowing, single-pass heat exchanger test rig. Heneghan et al. further disclose in item 4 on page 481 that in order to measure the carbon deposition of the sample, the test section of the rig is removed, drained, cut into 25 mm or 50 mm length segments, rinsed with hexane, dried in a vacuum oven and analyzed for carbon deposits on a Leco RC-412 multiphase carbon analyzer. At best, Heneghan et al. therefore merely disclose analyzing three baseline jet fuels and three blended fuels. Thus, not only do Heneghan et al. not disclose the step of conducting molecular modeling of at least one fuel additive to formulate a leading candidate fuel additive composition sample for testing, Heneghan et al. likewise do not disclose the step of containing a plurality of at least 20 of the leading candidate fuel additive composition samples in a plurality of test receptacles.

In the Office Action, the Examiner states that Heneghan et al. teach the use of molecular modeling as set forth in step (a) for further refinement of the fuel additives. Specifically, in the Office Action, the Examiner states (original emphasis):

> "'...**The test rig yielded quantitative results, which will be very useful** in evaluating fuel additives, understanding the chemistry of deposit formation, and eventually **developing a global chemistry model**.' ...
>
> Heneghan finally concludes:
>
> 'In the future, it will be interesting to study the oxygen and methane behavior for fuel additives to determine whether the observed trends for oxygen, methane, and deposits continue. So far, these trends clearly suggest that the consumption of oxygen at lower temperature and the more rapid production of methane indicate fewer deposits on the test section walls.' (page 485, col. 1, second paragraph)

> Heneghan teaches the use of his molecular modeling for further refinement of the fuel additives, he does not explicitly state that it be the first step in the high throughput screening process."

Thus, the Examiner has taken the position it would have been obvious to one skilled in the art to perform the molecular modeling prior to preparing samples based on the teachings of Bartz et al. Applicants respectfully submit that the Examiner's position is misplaced.

First, Heneghan et al. fail to disclose using molecular modeling to better predict leading candidate samples prior to testing the samples. At best, Heneghan et al. disclose developing molecular modeling using the data generated by *first creating samples and then testing them*. Thus, it is clear that Heneghan et al. disclose first creating samples, testing the samples, collecting the data therefrom, and then using that data to develop a model to evaluate the fuel additives. This is clearly different from Applicant's step of "conducting molecular modeling of at least one fuel additive to formulate a leading candidate fuel additive composition sample for testing" as Heneghan et al. disclose a model obtained from testing the fuel additive. Thus, Heneghan et al. teach away from the presently claimed invention. Pursuant to MPEP 2145 X.D.2, it is improper to combine references where one reference teaches away from their combination. Moreover, the court in *In re Geisler,* 116 F.3d 1465, 1471, 43 USPQ2d 1362, 1366 (Fed. Cir. 1997) held that a prima facie case of obviousness can be rebutted by showing that the art teaches away from the claimed invention. "A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant." *In re Gurley*, 27 F.3d 551, 553, 31 USPQ2d 1130 (Fed. Cir. 1994); *see KSR*

Int'l Co. v. Teleflex, Inc., 127 S. Ct. 1727, 1739–40, 82 USPQ2d 1385, 1395 (2007) (explaining that when the prior art teaches away from a combination, that combination is more likely to be nonobvious). As is the case here, Heneghan et al. teach away from Applicant's claimed step of "conducting molecular modeling of at least one fuel additive to formulate a leading candidate fuel additive composition sample for testing" as they are only concerned with developing a modeling using the data generated by *first creating samples and then testing them*.

Moreover, as acknowledged by the Examiner in the present Office Action, Heneghan et al. also fail to disclose the step of "wherein the step of measuring the deposit formation of each sample comprises heating the sample to a first predetermined temperature and determining the weight loss of the sample after a first predetermined period of time". As further acknowledged by the Examiner in the present Office Action, Heneghan et al. likewise fail to disclose step (d), i.e., "the results of step (c) for each sample are transmitted to a computer, wherein the computer compares the results with a predetermined value delimiting a failure or passing of the results, and the computer identifies failed samples to preclude further testing of the failed samples". Thus, Heneghan et al. are even further removed from the presently claimed invention by failing to disclose, much less suggest, any of steps (a)-(d) of the presently claimed method. Thus, one skilled in the art would not look to Heneghan et al. as a starting reference to arrive at the presently claimed "high throughput method for screening fuel additive composition samples, under program control, comprising: (a) conducting molecular modeling of at least one fuel additive to formulate a leading candidate fuel additive composition sample for testing; (b) containing a plurality of the leading candidate fuel additive composition samples in a plurality of

test receptacles, each sample comprising at least one fuel additive, wherein the plurality of leading candidate fuel additive composition samples is at least 20; (c) measuring the deposit formation of each sample to provide deposit formation data results for each sample, wherein the step of measuring the deposit formation of each sample comprises heating the sample to a first predetermined temperature and determining the weight loss of the sample after a first predetermined period of time; and, (d) outputting the results of step (c), wherein in step (d) the results of step (c) for each sample are transmitted to a computer, wherein the computer compares the results with a predetermined value delimiting a failure or passing of the results, and the computer identifies failed samples to preclude further testing of the failed samples."

Bartz et al. and Chadwick do not cure the deficiencies of Heneghan et al. Rather, Bartz et al. disclose treating wax-containing distillate fuel, wherein the wax crystals form in the distillate fuel as it cools, with additives that interact with these waxes during crystallisation to produce precipitated wax of reduced crystal size. The Examiner has added Bartz et al. to the combination because Bartz et al. also teach performing molecular modeling. However, nowhere in Bartz et al. is there any disclosure, much less any suggestion, that molecular modeling can be carried out in a high throughput methodology to screen leading candidate fuel additive composition samples for deposit formation. In fact, Bartz et al. do not disclose any combinatorial methodology in any form, nor does it provide any motivation to modify its disclosure to incorporate combinatorial methodology. Rather, Bartz et al. are totally silent as to the concept of high throughput combinatorial methodology for screening. Thus, one skilled in the art would not look to Bartz et al. to modify the teachings of Heneghan et al. and arrive at the presently claimed method.

Chadwick, on the other hand, disclose a business method and system for implementing those methods which improve the effectiveness and success of the research and development of technology such as pharmaceuticals, biotechnology, agrochemicals, medical technology, and genomics. The Examiner has added Chadwick to the combination for using a threshold value or cutoff to determine which tests or compounds no longer have further interest since they do not meet specific criterion, and because it teaches an arbitrary lead optimization process, which a skilled artisan could modify by selecting the appropriate number of samples based upon the project. This, however, does not cure the defects noted above. Nowhere does Chadwick teach either conducting molecular modeling prior to creating samples, or performing any screening step to determine deposit formation in an automated fashion under program control. Thus, the combination of Heneghan et al., Bartz et al. and Chadwick fails to disclose or suggest every limitation recited in amended Claim 64.

Cherpeck '178 likewise fail to cure the deficiencies of Heneghan et al., Bartz et al. and Chadwick. Rather, Cherpeck '178 discloses that condensation products and their fuel-soluble salts are useful as fuel additives for the prevention and control of engine deposits. Cherpeck '178 further discloses individually testing the test compounds in gasoline for their deposit reducing capacity in an ASTM/CFR single-cylinder engine test, i.e., a non-automated testing method. At no point however is there any suggestion or motivation in Cherpeck '178 to screen leading candidate fuel additive composition samples in a high throughput combinatorial manner under program control employing the specifically recited steps in amended Claim 64. In fact, Cherpeck '178 does not disclose any combinatorial methodology in any form, nor does it provide

any motivation to modify its disclosure to incorporate combinatorial methodology. Rather, Cherpeck '178 is totally silent as to the concept of high throughput combinatorial methodology for screening. Accordingly, one skilled in the art would not look to the non-automated testing method of Cherpeck '178 to modify the jet fuel thermal stability study disclosed in Heneghan et al. and arrive at the presently claimed method for screening leading candidate fuel additive composition sample for deposit formation.

Accordingly, amended Claim 64, from which Claims 67 and 72-74 are nonobvious, and therefore patentable, over Heneghan et al., Bartz et al., Chadwick and Cherpeck '178, no matter how these references are considered or combined. Thus, Applicant respectfully requests that the rejection under 35 U.S.C. §103(a) be withdrawn.

The Examiner has rejected Claims 75, 76 and 78-80 under 35 U.S.C. §103(a) as being unpatentable over Heneghan, Bartz et al. and Chadwick, as applied to Claims 64-66, 71, 79, 83 and 84 above, and further in view of Burow et al. U.S. Patent Publication No. 2002/0090320 ("Burow et al."). As independent Claim 64, from which Claims 75, 76 and 78-80 ultimately depend, has been amended to incorporate the limitation of unrejected Claim 68, this rejection is deemed moot.

Moreover, the foregoing deficiencies of Heneghan et al., Bartz et al. and Chadwick discussed above apply with equal force to this rejection. Burow et al. do not cure the deficiencies of Heneghan et al., Bartz et al. and Chadwick. Rather, Burow et al. are simply cited for the disclosure of robotic assembly. Thus, even by combining Burow et al. with Heneghan et al., Bartz et al. and Chadwick, one skilled in the art would not arrive at the presently claimed

invention. Besides, Burow et al. disclose methods and systems for high throughput processing, used typically in the biotechnology and biomedical industries, in order to screen chemical and/or biochemical libraries. Certainly, one skilled in the art would not look to high throughput processing used typically in the biotechnology and biomedical industries to modify a high throughput system for screening leading candidate fuel additive composition sample for deposit formation. Accordingly, Claims 75, 76 and 78-80 are nonbvious, and therefore patentable, over Heneghan et al., Bartz et al., Chadwick and Burow et al., no matter how these references are considered or combined. Thus, Applicant respectfully requests that the rejection under 35 U.S.C. §103(a) be withdrawn.

The Examiner has rejected Claims 70, 81 and 82 under 35 U.S.C. §103(a) as being unpatentable over Heneghan, Bartz et al. and Chadwick, as applied to Claims 64-66, 71, 79, 83 and 84 above, and further in view of Cherpeck U.S. Patent No. 5,306,315 ("Cherpeck '315"). As independent Claim 64, from which Claims 70, 81 and 82 ultimately depend, has been amended to incorporate the limitation of unrejected Claim 68, this rejection is deemed moot.

Moreover, the foregoing deficiencies of Heneghan et al., Bartz et al. and Chadwick discussed above apply with equal force to this rejection. Cherpeck '315 do not cure the deficiencies of Heneghan et al., Bartz et al. and Chadwick. Rather, Cherpeck '315 is cited for the disclosure of measuring fuel deposits by thermal gravimetric analysis. However, Cherpeck '315 discloses individually testing samples in a Waukesha CFR single-cylinder engine for fuel deposits. Thus, even by combining Cherpeck '315 with Heneghan et al., Bartz et al. and Chadwick, one skilled in the art would not arrive at the presently claimed invention. Besides,

one skilled in the art would not look to the non-throughput testing method of Cherpeck '315 to modify the jet fuel thermal stability study disclosed in Heneghan et al. and arrive at the presently claimed method for screening leading candidate fuel additive composition sample for deposit formation. Accordingly, Claims 70, 81 and 82 are nonbvious, and therefore patentable, over Heneghan et al., Bartz et al., Chadwick and Cherpeck '315, no matter how these references are considered or combined. Thus, Applicant respectfully requests that the rejection under 35 U.S.C. §103(a) be withdrawn.

Claims 64-84 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over the claims of co-pending Application No. 12/799,817. Upon resolution of all outstanding issues remaining in the Office Action, Applicants will consider the timely submission of a Terminal Disclaimer.

For the foregoing reasons, Claims 64-67 and 69-84 as presented herein is believed to be in condition for allowance. Such early and favorable action is earnestly solicited.

Respectfully submitted,

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